

I. **Status of the Claims**

Claims 1-5 are pending. Claim 1 is amended to recite that the thickener is an alkali-swelling associative thickener. Support for this amendment is found in the application as filed, for example at page 6, lines 20-22, and in original claim 1.

New claim 5 is added. Support for new claim 5 is found in the application as filed, for example at page 10, line 2.

No new matter is added by this amendment.

II. **Rejections Under 35 U.S.C. §102**

At paragraph 3 of the Office Action, claims 1 and 2 stand rejected under 35 U.S.C. §102(b) as anticipated by JP 6346014. The Examiner states that JP '014 describes a water based ink composition which meets all the limitations of the claims, i.e., comprises a pigment, a polar solvent comprising water and another solvent, a pH controlling agent, and 0.01-10 weight percent thickener containing a hydrophobic group and a carboxyl group which swells in an alkaline medium resulting in an increase in viscosity of the ink.

In response, the Examiner's attention is respectfully directed to claim 1, as now amended. Claim 1 is now amended to recite an alkali-swelling associative thickener.

As explained in the specification of this application, at page 6, lines 10-19, the alkali-swelling associative thickener of the invention contains both a

hydrophobic group and a hydrophilic group, which increases the viscosity of the ink composition "by a steric hindrance resistance viscosity brought about by hydration swelling of the hydrophilic group in the thickener molecule on the components contained in the ink composition . . ." *See also* page 7, line 13 to page 8, line 25. Exemplary alkali swelling associative thickeners are identified at page 9, lines 12-24 as Primal TT-935, Primal TT-950, Primal TT-615 and RM-825.

The Examiner is advised that the claimed alkali-swelling associative thickeners are different than the "carboxylated acrylic type, styrene/acrylic type, or butadiene type" thickeners in JP '014, and cause thickening by a different mechanism than the claimed thickeners. The thickeners in JP '014 swell with an alkali agent, i.e., "thickens when the alkali agent . . . is added." *See* pages 4, lines 24-25. Thus, the ink compositions of JP '014 require the presence of an alkali agent, such as those described at page 6, lines 2-9. At page 8, lines 9-12, JP '014 states that the alkali agent should be present in an amount sufficient to produce a composition with a pH of 8 or higher.

Further, the "alkali-thickened-type emulsion" exemplified in JP '014 in Working Example 3 is Primal RM-5 (which is believed to be the same as Primal RX-5), which is a product of Rohm & Haas Co. At page 10, lines 4-8 of the specification of the application, RM-5 is distinguished from the alkali-swelling associative thickeners of the invention. The specification states that the RM-4 and RM-5 thickeners "have little associative property and do not have the thickening actions described above."

The Examiner's attention is also directed to Comparative Example 4 in the specification of the present application, which uses Primal RM-5 in the relatively large amount of 20 parts for thickening. The ink composition of Comparative Example 4 exhibits a decreased effect on thickening, in comparison to the Examples using the alkali-swelling associative thickeners of the invention.

In view of the action taken, it is believed that the above referenced anticipation rejection has been overcome, and it is respectfully requested that the rejection be withdrawn.

### **III. Rejections Under 35 U.S.C. §103**

#### **A. Rejection of Claims 1 and 2 from March 2, 2000 Office Action**

Claims 1 and 2 stand rejected as obvious over Okumura et al. (U.S. Patent No. 5,580,374) either alone or in view of Doolan et al. (U.S. Patent No. 5,425,806) and Shay et al. (U.S. Patent No. 5,478,602). In the prior Office Action, the Examiner stated that the only element of the claims not shown in Okumura is that the thickeners "are not explicitly referred to as alkali-swelling associative thickeners." The Examiner added that "it is natural to infer that these polymers would function the same as the thickeners presently claimed regardless of what they are called by Okumura et al."

Applicants respectfully maintain the traversal of this rejection, and direct the Examiner's attention to claim 1 as now presented.

In the previous response, applicants argued that the acryl-based resins of Okumura are dispersants, not thickeners, and that the synthetic polymers used as thickeners in Okumura do not function in the same way as the claimed alkali associative thickeners. The Examiner is requested to take note that there is simply no teaching in Okumura et al. that the thickeners described therein are alkali associative thickeners of the type claimed. The Examiner is requested to compare Example 4 in the present application with Examples 1 to 4 and 7 in Okumura. In Okumura, 3.0% of a resin (in Examples 1 to 4) and 3.0% of the resin and 0.5% of a polysodium acrylate thickener (in Example 7) are used. The resultant viscosities are 3.5 to 3.8 mPa's in Examples 1 to 4 and 120 mPa's in Example 7. On the other hand, the Examples in the present application use only 0.3 - 0.6% (3.0 - 6.0 x 10% in solution of the claimed thickener) to increase the viscosity to 196 - 452 mPa's.

The Examiner is also referred to the language in the specification, at page 10, lines 4-9, which distinguishes the acryl polymer Primal RM-5 from the alkali-swelling associative thickeners of the invention. The Examiner is requested to take note that not all acryl polymers are alkali-swelling associative thickeners.

In addition, the Examiner's attention is respectfully directed to new claim 5, which recites that the thickener is present in the amount of 0.1 to 2.0% by weight based on the ink composition.

In view of the action taken and arguments made, it is believed that the above referenced obviousness rejection has been overcome, and it is respectfully requested that the rejection be withdrawn.

**B. Rejection of Claims 3 and 4 from March 2, 2000 Office Action**

Claims 3 and 4 stand rejected as obvious over Okumura et al. (U.S. Patent No. 5,580,374) either alone or in view of Doolan et al. (U.S. Patent No. 5,425,806) and Shay et al. (U.S. Patent No. 5,478,602) as applied to claim 1 and 2, and further in view of Kobayashi et al. (U.S. Patent No. 4,822,417) or JP 54138732.

As noted above, claim 1 has been amended to recite that the thickener is an alkali-swelling associative thickener. The claimed thickeners are neither described nor suggested in the primary reference Okumura, which describes thickeners which are not alkali associative thickeners. As a result, the claimed invention is not obvious over Okumura, either alone or in view of Doolan, Shay, Kobayashi and JP '732.

In view of the action taken and arguments made, it is believed that the above referenced obviousness rejection has been overcome, and it is respectfully requested that the rejection be withdrawn.

**C. Rejection of Claims 3 and 4 over JP 6346014**

Claims 3 and 4 stand rejected as obvious over JP 6346014, in view of either Kobayashi or JP 54138732. The Examiner states that the difference between

JP '014 and the claims are the requirement that the pigment surface is treated with a resin and/or surfactant. The Examiner takes the position, however, that Kobayashi describes use of pigments which are surface treated with resins in order to improve dispersibility, stability and workability (column 2, lines 26-33) and JP '732 describes the use of pigments surface treated with resin in order to increase stability and water-resistance. The Examiner concludes that "it would have been obvious to one of ordinary skill in the art to use this type of pigment in ink of JP '014 in order to produce an ink that has excellent dispersibility, stability and water-resistance, and thereby arrive at the claimed invention."

As noted above, claim 1 has been amended to recite that the thickener is an alkali-swelling associative thickener, which is neither described nor suggested in the primary reference JP '014. Since the thickeners used in JP '014 differ from the claimed thickeners, and since JP '014 does not describe or suggest use of the claimed thickeners, claims 3 and 4 should not be obvious over the cited references.

In view of the action taken and arguments made, it is believed that the above referenced obviousness rejection has been overcome, and it is respectfully requested that the rejection be withdrawn.

**D. Rejection of Claims 1 and 2 over WO 95/10571 in View of Hawley's Condensed Chemical Dictionary**

At paragraph 8 of the Office Action, claims 1 and 2 stand rejected as obvious over WO 95/10571 in view of *Hawley's Condensed Chemical Dictionary*, pp.

319 and 702. The Examiner states that WO '571 describes a water-based ink composition of the invention, but that "(a) there is no explicit disclosure that the thickener comprises a carboxyl group and a hydrophobic group and (b) there is no explicit disclosure that the oils disclosed are polar solvents." However, the Examiner points out that WO '571 describes acrylic resin thickeners, and that it would have been obvious to one of ordinary skill in the art that acrylic resins contain both a hydrophobic acrylic backbone as well as a carboxyl group. With respect to the difference in solvents, the Examiner states that WO '571 describes the use of linseed oil, which is polar due to the presence of a C=O group. *See Hawley's Dictionary* at pp. 319, 702.

In response, the Examiner is referred to the amendment to claim 1, reciting that the solvents are water-miscible. WO '751 describes an aqueous ink containing a pH dependent thickener which swells in an alkali medium. However, '751 uses oil and an emulsifier and does not use a polar solvent which is miscible with water. The oils such as linseed oil and cottonseed oil used in WO '751 are lubricants which are not miscible with water and have little polarity. Hence, WO '751 does not use a pH dependent thickener with a polar water-miscible solvent. As a result, one of ordinary skill in the art would not understand WO '751 to describe inks of the type claimed.

In view of the action taken and arguments made, it is believed that the above referenced obviousness rejection has been overcome, and it is respectfully requested that the rejection be withdrawn.

**E. Rejection of Claims 3 and 4 over WO 95/10751 in View of Kobayashi et al. or JP '732**

At paragraph 9, claims 3 and 4 stand rejected as obvious over WO '571 as applied to claims 1 and 2 above, and further in view of either Kobayashi or JP 54138732. The Examiner states that the difference between claims 3 and 4 and WO '571 is the requirement of a pigment surface treated with a resin and/or surfactant. The Examiner relies on both Kobayashi and JP '732, as discussed above.

As noted above, WO '751 does not describe or suggest the claimed ink compositions, since WO '571 does not teach the use of polar water-miscible solvents. As a result, one of ordinary skill in the art would not understand WO '751 to describe inks of the type claimed.

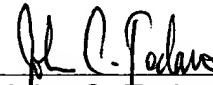
In view of the action taken and arguments made, it is believed that the above referenced obviousness rejection has been overcome, and it is respectfully requested that the rejection be withdrawn.

IV. Conclusion

In view of the foregoing, it is believed that pending claims 1-4 are neither anticipated by nor obvious over the cited references, and it is further believed that claims 1-4 are now in condition for allowance.

Favorable action is earnestly solicited.

Respectfully submitted,

  
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